Appendix A

NIST Examination Procedure Outline No. 23

Vehicle-Tank Meters
Power-Operated

EPO No. 23

Examination Procedure Outline for

Vehicle-Tank Meters Power-Operated

It is recommended that this outline be followed for all power-operated vehicle-tank meters – analog or digital. Nonretroactive requirements are followed by the applicable date in parentheses. Do not use this outline for testing milk metering systems, or gravity-discharge vehicle tank meters.

SAFETY NOTES

When excerpting this Examination Procedure Outline for duplication, the "Safety Considerations" section and the "Glossary of Safety Key Phrases" should be duplicated and included with the outline.

The inspector is reminded of the importance of evaluating potential safety hazards prior to an inspection and taking adequate precautions to avoid personal injury or damage to the device. The inspector should read and be familiar with the introductory section on safety found at the beginning of this publication. As a minimum, the following safety precautions should be noted and followed during the inspection. Definitions of each reminder are found in the "Glossary of Safety Key Phrases" at the back of this publication.

Many policies and regulations will vary from jurisdiction to jurisdiction. It is essential that the inspector or serviceperson be aware of all safety regulations and policies in place at the inspection site and to practice the safety policies established by the inspector's or serviceperson's employer. The safety reminders included in this EPO contain general guidelines for safety. These guidelines are useful in alerting inspectors and servicepersons to the importance of taking adequate precautions to avoid personal injuries. These guidelines can only be effective in mitigating safety hazards if inspectors and servicepersons receive training in hazard recognition and controls.

Clothing

Electrical Hazards

Emergency Procedures

Eye Protection

Fire Extinguisher

First Aid Kit

Grounding

Ignition Sources

Lifting

Location
also: **Wet/Slick Conditions, Chemicals, Hazardous Materials,** Petroleum Products, Obstructions

Material Safety Data Sheets (MSDS)

Nature of Product

Personal Protection Equipment
e.g. Safety Shoes, Safety Aprons, Gloves, Hard Hat, etc. if deemed necessary

Safety Cones/Warning Signs

Static Discharge

Switch Loading

Traffic

Transportation of Equipment

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Inspection:

Safety First !!!

Check the inspection site carefully for safety hazards and take appropriate precautions

Check to be certain that the ground surface of the inspection site is sufficiently strong and rigid to support the Prover when it is filled with product – don't forget to chock the wheels of the prover

Learn the nature of hazardous products used at or near the inspection site – obtain and read Copies of MSDS's

Know emergency procedures and location and operation of fire extinguisher and emergency shut-offs

Post safety cones/warning signs and be aware of vehicular and pedestrian traffic patterns

Use caution in moving in wet, slippery areas and climbing on prover, storage tanks, and vehicles

Use personal protection equipment and clothing appropriate for the inspection site

If leaks, spills, or exposed wiring cause hazardous testing conditions it is recommended that the testing be discontinued until the unsafe conditions are corrected

Be sure that a first aid kit is available and that it is appropriate for the type of inspection activity

H-44 General Code and Vehicle-Tank Meters Code References

1. General considerations.
   - Selection ..... G-S.3., G-UR.1.1., G-UR.1.2., G-UR.1.3.
   - Installation ..... G-S.2., G-UR.2.1., G-UR.2.2., UR.1.1.
   - Position of Equipment ..... G-UR.3.3.
   - Accessibility ..... G-UR.2.3.
   - Assistance G-UR.4.4., G-UR.4.6
   - Use and maintenance ..... G-UR.3.1., G-UR.4.1., G-UR.4.2., UR.2.3.

2. Marking ..... G-S.1., G-UR.2.1.1., S.5.1, S.5.2.

3. Indicating and recording elements.
   - Design ..... S.1.1.1.
   - Units ..... S.1.1.2.(a), S.1.1.3.(b) and (c)
   - Readability ..... G-S.5., G-S.6. (1/1/77), G-S.7., S.1.2., S.1.3.
   - Values of intervals ..... G-S.5.3.
   - Computing-type devices
     - Display of unit price ..... S.1.4.1, UR.1.2.
     - Printed ticket ..... S.1.4.2., UR.2.2.
     - Exceptions for the Sale of Aviation Fuel ..... UR.2.2.1.
     - Money-value computations ..... S.1.4.3.

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Inspection (Cont.):

3. Indicating and recording elements (cont.).
   - Advancement and return to zero ..... S.1.1.4., S.1.1.5., UR.2.1.
   - Provision for sealing ..... G-S.8. (1/1/90), G-UR.4.5.

4. Measuring elements.
   - Vapor Elimination ..... S.2.1.
   - Security seal on adjusting mechanism ..... G-UR.4.5., S.2.2.

5. Piping.
   - Directional flow valves and discharge line and valves ..... S.2.3., S.3.
   - Antidrain valve ..... S.3.6.
   - Leaks ..... G-UR.4.1.
   - Facilitation of fraud ..... G-S.2.

Pretest Determinations:

1. Determine that the test fluid in the tank compartment is Similar in character to the fluid to be measures ..... N.1.

2. Test Drafts: determine if the prover size is adequate ..... N.3.

3. Tolerances.
   - Applicable requirements ..... G-T., T.1.
   - Tolerance values ..... T.2.
   - Agri-chemicals ..... T.3.
   - Repeatability ..... T.4.

4. Note totalizer reading

Test Notes:

Wear appropriate personal protection equipment such as petroleum-resistant, nonskid safety shoes (to prevent possible injury from spills or slipping on slick surfaces), protective clothing, eye protection (to prevent injury from splashed product), and a hard hat (to prevent injury from overhangs and projections)

Use proper grounding procedures

Be sure that prover is equipped with an explosion proof motor

Carefully inspect electrical supply lines to test equipment for wear and damage; correct potentially hazardous conditions before use

Device operator should be present at all times during test – the operator (not the inspector) should operate the device under test

Never leave equipment unattended while it is in operation

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Test Notes (cont.):

1. Wet prover. Allow a 30-second drain period each Time prover is emptied.

2. Evaporation and Volume Change: exercise care so the product temperature is the same in the prover as at the meter..... N.2.

3. Record totalizer (s) indication before and after each draft to determine proper operation

4. After each test draft:
   a. Print a ticket (if so equipped)..... G-S.5.6.
   b. If computing type, check price computation on indicator and on recorded representations..... G.S.5.6., S.1.4.2., S.1.4.3., S.1.4.4.
   c. Check for agreement between indicators ..... G-S.5.2.2.

Test:

If supply or return lines are not coupled at their discharge ends, they must be held in place continuously while product flows through the line

Use proper lifting techniques to lift and move equipment

Be aware of and attempt to eliminate potential ignition sources in or near the inspection site

Be aware of vehicular and pedestrian traffic in the area

1. Normal test--full flow, basic tolerance..... N.4.1., T.2.

2. Special test--slow flow, special tolerance ..... N.4.2.(a), T.2.

   If either test result is close to or outside the applicable tolerance, repeat the test.

3. Special test – split compartment, special tolerance..... S.2.1., N.4.2.(b), T.2.
   a. Start test (normal flow rate) from a compartment containing less test fluid than one-half the capacity of the prover and with pump in operation and pressure to the discharge nozzle.
   b. Permit test to continue until lack of fluid supply causes meter register to stop absolutely.
   c. With pump in operation, shut manifold valve (or disconnect whip-hose connection) from now empty compartment
   d. Open valve from compartment with adequate supply of fluid to complete test.

4. RFI/EMI test (electronic equipment only)..... G-N.2., G-UR.1.2., G-UR.3.2., G-UR.4.2.
   Radio frequency interference (RFI)
   Electromagnetic interference (EMI)

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Test (cont.):

5. Check automatic stop mechanism. ..... G-UR.4.1.
   The device should stop the flow within
   one-half the minimum interval indicated

6. Check effectiveness of antidrain valve..... S.3.6., N.4.3.
   (with pump pressure off line)

7. Security seal ..... G-UR.4.5.

   Record on the official report the number of gallons of product dispensed during test.

Avoid switch loading!
Test devices dispensing low-vapor pressure products (e.g., diesel fuel, kerosene)
Before testing devices dispensing high-vapor pressure products (e.g., gasoline)

8. After all equipment at a location has been tested,
   review results to determine compliance with:
   Maintenance of Equipment..... G-UR.4.1.
   Use of Adjustments.. ..... G-UR.4.3.

Take precautions to isolate equipment when
Transporting it to avoid exposure to hazardous fumes